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My view

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Socks and shoes, hot dogs and baseball, fall and football . . . biological weed control and weed scientists? The former are commonly accepted pairs; the last should be a match, but in general is not. Why, when one thinks of biological weed control using insects, is the common match "entomologist," and if using pathogens, the match becomes "pathologists"? Where are *weed* scientists in *weed* biocontrol. With few exceptions, weed scientists have left the field to others and now are wondering when the coach will let them play.

The North Dakota Weed Control Association and State Department of Agriculture made this clear last year. They wanted the university to expand its effort in biological control of weeds. Representatives of the groups approached me to explore the possibilities and their first words were, "How long will it take to get an entomologist hired to take over this responsibility?" Well, I was less than pleased and my question in return was, "Why do you want an entomologist to do a weed scientist's job?" They responded, "Because we will be using insects, not herbicides." I guess that is all weed scientists are good for, spraying herbicides! At least, that is the way many perceive us.

Picture yourself with the opportunity to attend the International Symposium on the Biological Control of Weeds in South Africa. I did and was a little apprehensive because of political turmoil in the news. I wondered what it would be like to be in the minority. What I did not expect was to be hit between the eyes with my minority status as a weed scientist among entomologists, pathologists, ecologists, and botanists. Where were my colleagues? There were barely a handful of us among the 175 scientists meeting to discuss weed control!

Why have we weed controllers not become part of weed biocontrol? As students, we all took entomology courses; we know what insects are; why are we intimidated by a field of research that uses them to control weeds? Is the science of pathogens too lab oriented or technical for us?

I don't think either of these is the reason. We are too busy putting out the fire that comes with each spring's planting. It also goes back to weed scientists being the "new kids" on the block with fewer numbers than their colleagues in Plant Pathology and Entomology. In North Dakota, 93% of all pesticides applied each year are for weed control. In turn, the growers, i.e., our clientele, direct a high percentage of phone calls and inquires to weed scientists at this station concerning weed control problems. Yet we have less than 50% of the FTEs of either of the other two disciplines. The situation is similar at many universities and in the USDA. Weed scientists have to answer immediate questions, and demands on their time prohibit branching into biocontrol. How many of us would survive the wrath of our clientele if we told them, "I'll get back to you in 10 or 20 years," which is the time it takes to search, import, establish, and evaluate a biocontrol agent.

However, not enough time has become an overused excuse. We prioritize our research, yet many ignore biocontrol. I have attended national and regional weed science meetings where the talk is of reduced pesticide use, yet to review the research in progress by many weed scientists is to see more screenings of new and old herbicides. The proof of our convictions is in the literature.

Another reason for nonparticipation may be lack of funding. Certainly, there is no BioControl Inc. with grants to fund research. Other funding sources are available: federal grants, land management associations, and some private industries that want to get involved with biocontrol as part of integrated weed management.

A common rationalization for nonparticipation is the lack of biocontrol agents for cropland weeds. However, this area of research is gaining momentum. Pathogens currently are being evaluated for control of grass weeds in cereal crops in Vietnam and Australia, velvetleaf in soybean in Canada, and pigweed in citrus crops in Florida.

Biological weed control is not a magic bullet. It is another tool to control weeds. Insects will not eliminate their only source of food; thus, no weed will be eradicated. Nor can insects go it alone. A good example of limitations is biocontrol of musk thistle using *Rhinocyllus conicus.* The insect larvae do a good job of devouring the achenes in nearly every flower, which should control this biennial. Unfortunately, the insect's life cycle is shorter than the flowering period of musk thistle. Thus, after the insect dies in mid-August, there are no adults to lay eggs in the flowers that appear from then until frost in mid- or late-October. More than enough seed are produced during this time to keep the infestation established and allow it to expand. Other forms of control are needed to control musk thistle satisfactorily. Insects alone are not the complete answer; biological control requires integration with other forms of cultural, chemical, and mechanical weed control.

Weed scientists have been trained as generalists; they have backgrounds in plant anatomy, entomology, pathology, and soil science. Incorporation of all these fields will make biocontrol successful, not reliance on single or even multiple biological organisms. There is a need for the common sense weed scientist in the field of biological weed control. We should be the linchpin holding the integrated programs together rather than standing on the sideline waiting to get in on the final 2 minutes of action.

The next international biocontrol of weeds symposium will be held in Bozeman, MT, in 1999. Plan now to attend and perhaps even report on your latest findings using biocontrol organisms in this dynamic, challenging, and rewarding area of weed science research.